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MONTHLY REPORT

ON THE NUCLEAR FUEL MARKET

NUEXCO

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MONTHLY REPORT ON THE NUCLEAR FUEL MARKET

May 1986 No. 213

GEORGE WHITE, JR., *EDITOR* CLARK M. BEYER, *ASSOCIATE EDITOR*

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NATURAL URANIUM AND SECONDARY MARKET CONVERSION

(All data as of April 30, 1986)

The **Exchange Value** is **$17.25** per pound U_3O_8, unchanged since last month. **Active supply** of natural uranium (concentrates and UF_6) for spot or near-term delivery totals **2,590,000** pounds U_3O_8 equivalent, up 65 thousand pounds since last month. The corresponding figure for **active demand** is **1,225,000** pounds, up 275 thousand pounds. The spot and near-term **supply-demand ratio** declined to **2.1:1.**

The *Current Market Data* section of this Report lists six natural uranium sales, involving approximately 1.4 million pounds equivalent U_3O_8. Five of the transactions involved near-term delivery and five met the criteria for inclusion in the current Transaction Value calculation. Four transactions involved natural UF_6.

The **Transaction Value** is **$17.10** per pound U_3O_8, up $0.40 since last month. The calculation extends over a 5-month period and includes 19 transactions involving 2.3 million pounds equivalent U_3O_8. The sizeable rise in the Transaction Value is due to the removal from the calculation of October and November 1985 transactions. Those transactions involved over one million pounds equivalent U_3O_8 at prices around $16.25.

The **UF_6 Value** is **$48.50** per kilogram U in UF_6, up $0.50 since last month.

The **Conversion Value** is **$1.90** per pound U in UF_6, up $0.10 since last month. Active supply of secondary market conversion services for delivery within three years totals 825 thousand pounds U as UF_6. Active demand totals 625 thousand pounds U as UF_6. Two secondary market conversion transactions are reported.

The **Loan Rate** is unchanged at **5 percent** per annum.

* * *

The market for natural uranium concentrates strengthened for a short time in the middle of April, but an abundance of supply and a lack of firm U_3O_8 buyers at the end of the month precluded a rise in the Exchange Value. Several suppliers have expressed cautious interest in offering concentrates at prices near the $17.25 level, but any sellers wishing to dispose of material quickly would probably need to offer some discount in order to complete a sale. Conversely, there may not be enough low-priced supply to meet unanticipated demands for very large quantities of U_3O_8. At present, however, only one potential buyer of concentrates remains in the market and there is no indication that it will act in the immediate future. In general, while some offering prices rose slightly near the end of the month, significant quantities of material at the $17.25 level remained in the market.

The psychological effects of the nuclear plant accident at the Chernobyl station in the USSR (see page 16 of this Report) have yet to cause any specific changes in the uranium market as of this writing. However, a period of uncertainty in the market is inevitable considering the apparent severity of the accident and the worldwide public reaction. Ultimately, if the accident results in additional plant delays or cancellations, both the spot and long-term markets for uranium will be adversely affected.

A recent increase in buyer interest in UF_6 (as compared to U_3O_8) caused some upward movement in the UF_6 Value, which rose to $48.50. Much of the current firm demand is for UF_6. However, several transactions in recent months, including four during April that are reported by Nuexco, have reduced the availability of UF_6, although several utilities remain in the market. In general, demand for concentrates is more discretionary than demand for UF_6, which tends to be based more on immediate reactor requirements than on strategies for inventory purchasing. At least one utility is interested in a large quantity of UF_6 because of such upcoming reactor needs.

* * *

The Conversion Value rose to $1.90 this month in the wake of two secondary market transactions and a third in negotiation. One major seller of a large quantity of conversion services remains in the market, as do a few others offering smaller quantities. Following the probable sale of one utility's inventory, the remaining sellers are highly discretionary, contributing to the upward price movement, and are offering a wide range of prices. Although the algebraic sum of the Exchange Value and Conversion Value exceeds the UF_6 Value by $0.75, UF_6 sellers are reluctant to *deconvert* their material because of uncertainty in the market for concentrates, where demand is thin.

Sequoyah Fuels received authorization to reopen its conversion facility to receive incoming uranium shipments of concentrates and to ship out UF_6 that had been converted prior to the accident. However, its UF_6 conversion operations remain suspended. Nevertheless, the action has relaxed some of the upward price pressure that had been expected in the secondary conversion market. The movement of U_3O_8 into the facility has also reduced the need to arrange uranium swaps to fulfill contractual obligations. Overall, the closure of the facility had less impact on the uranium and secondary conversion market than originally anticipated.

ENRICHED URANIUM AND SWUS

The **SWU Value** as of April 30, 1986, is $80 per SWU. This refers to SWU at a tails assay of 0.30 weight-percent U_{235} and for delivery within one year. Three secondary market SWU transactions are reported this month, involving less than 100 thousand SWUs.

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PRICING

While several transactions occurred in April at prices near the SWU Value, buyers seeking large quantities of SWU generally have been able to negotiate slightly lower prices. Nevertheless, the market remains very thin; the presence of one potential buyer interested in a large quantity will undoubtedly drive the SWU market until the purchase is made. The potential sellers are discretionary and have exhibited no desire to liquidate their SWU inventories rapidly.

* * *

In early April, Senator Pete Domenici (R, New Mexico) filed his long-anticipated legislation regarding uranium and enrichment in the USA. Entitled "The Uranium Revitalization and Tailings Reclamation Act of 1986," the bill is an attempt to address the problems and conflicting interests facing the uranium and enrichment industries in the USA. It appears that by providing something for all interested parties in an omnibus measure, the authors of the legislation hoped that the bill will be difficult to oppose. Each interest group will achieve certain desired ends if the legislation passes, but the cost to each is acceptance of other provisions that may be deemed undesirable.

Ordinarily, each of these diverse subjects would be the subject of separate legislation, but Senator Domenici, recognizing that passage of such individual bills would be difficult if not impossible, grouped them together into a single package. Proponents of the legislation point out that if the bill is rejected, courts will be forced to decide such matters as the legality of the Utility Services enrichment contract (USEC) and the issue of uranium imports, and no action necessarily will have been taken on the issues of mill tailings and privatization.

A review of the major provisions of the bill and expected positions of various interested parties are outlined in the following table. Others concerned with the outcome of the legislation include non-US enrichers, which would prefer to see DOE forced to charge higher prices, perhaps allowing them additional pricing flexibility. Likewise, governments of uranium-exporting countries will undoubtedly take issue with the 50-percent limitation on uranium imports.

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PROVISION	IN FAVOR	OPPOSED
1. Limit US utility use of non-US origin uranium to 50 percent	— US uranium producers — Some US utilities	— Most US utilities — DOE — US State Dept. — Non-US uranium producers
2. Approval of USEC in its present form	— DOE — Most DOE customers — Most other utilities worldwide	— Some DOE customers
3. Free VTAO between 0.20% and 0.35% U_{235}	— DOE customers — All uranium producers	— DOE — General Accounting Office — US taxpayer lobbies
4. Mill tailings legislation	— US uranium producers	— US utilities
5. Privatization of Enrichment Industry	— DOE — US Congress — Most DOE customers	— Some DOE customers

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CURRENT MARKET DATA

April 30, 1986	Market Values	Active Supply[1] (thousands)	Active Demand[1] (thousands)
EXCHANGE VALUE	**$17.25**/lb. U_3O_8	2,590	1,225
UF_6 VALUE	**$48.50**/kgU		
CONVERSION VALUE	**$1.90**/lb. U as UF_6	825	625
SWU VALUE 0.3 tails assay; delivery within one year	**$80**/SWU		
LOAN RATE	5%/annum	0	0

	$/lb. U_3O_8	Millions of Pounds	Number of Transactions	Number of Months
TRANSACTION VALUE	**17.10**	2.3	19	5

[1]Supply and demand tables in *Current Market Data* section of this Report detail the numbers for each category.

DEFINITIONS

1. The **Exchange Value** is Nuexco's judgment of the price at which transactions for significant quantities of natural uranium concentrates could be concluded as of the date indicated.
2. The **UF_6 Value** is Nuexco's judgment of the price at which spot and near-term transactions for significant quantities of natural uranium hexafluoride could be concluded as of the date indicated.
3. The **Conversion Value** is Nuexco's judgment of the price at which spot and near-term transactions for significant quantities of conversion services could be concluded in the secondary market as of the date indicated.
4. The **SWU Value** represents Nuexco's judgment of the price at which transactions for the sale of significant quantities of SWUs of stated origin for delivery in the specified time period could be concluded as of the date indicated.
5. The **Loan Rate** is Nuexco's judgment of the annual interest rate at which uranium loans could be concluded as of the date indicated.
6. The **Transaction Value** is a weighted average price of recent natural uranium sales transactions. The calculation is based on prices paid in:
   a. Transactions closed within the previous three-month period for which delivery is scheduled within one year of the transaction date;
   b. At least ten transactions;
   c. Transactions involving a sum total of at least 2 million pounds U_3O_8 equivalent.

   The sample time is extended as necessary to include these minima. Other currencies are converted to US dollars using conversion rates in effect on or near the transaction date.

DERIVATIONS AND COMMENTS

1. All Market Values are based on:
   a. Data from recently completed transactions.
   b. Data from pending transactions.
   c. Firm bids to buy or borrow, and firm offers to sell or lend.
   d. Prices purchasers or rates borrowers have expressed a willingness to pay, but for which Nuexco is not aware of firm bids to buy or borrow, and prices sellers or rates lenders have expressed a willingness to accept, but for which Nuexco is not aware of firm offers to sell or lend.
2. Prices associated with deliveries under old or renegotiated contracts or other than arm's-length transactions are not included in the determination of these Market Values.
3. In the determination of the Conversion Value, Nuexco does not consider transportation charges other than those customarily provided by primary suppliers of conversion services.
4. The prices of conversion services or SWUs delivered under long-term contracts with primary suppliers are not considered in the determination of either the Conversion Value or SWU Value.
5. For the SWU Value, Nuexco converts SWU prices at varying tails and product assays to equivalent SWU prices at a tails assay of 0.30 weight-percent U^{235} and a product assay of 3.0 weight-percent U^{235}, assuming feed costs corresponding to the Nuexco Exchange and Conversion Values determined as of the same date.
6. In calculating the Transaction Value, Nuexco does not account for the price of uranium delivered in connection with contracts which call for "market price" mechanisms. This exclusion applies particularly to contracts in which delivery prices are expressed as a function of future Exchange Values or any other indeterminate variable. Also excluded from the calculation are any other transactions in which the delivery price is defined in such a way that it cannot currently be determined.

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CURRENT MARKET DATA

EXCHANGE VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb. U_3O_8 in Concentrates			per kg. U in Concentrates		
	This Month (Apr 30, 1986)	Last Month (Mar 31, 1986)	12 Months Ago (Apr 30, 1985)	This Month (Apr 30, 1986)	Last Month (Mar 31, 1986)	12 Months Ago (Apr 30, 1985)
Australia (dollar)	23.31	24.20	21.72	60.60	62.92	56.47
Belgium (comm. franc)	762.95	823.00	891.18	1,983	2,140	2,317
Canada (dollar)	23.79	24.09	19.49	61.84	62.53	50.66
Finland (markka)	84.98	89.33	92.47	220.92	232.24	240.41
France (franc)	119.46	123.66	135.46	310.57	321.48	352.16
FRG (mark)	37.51	40.19	44.36	97.51	104.49	115.34
Italy (lira)	25,723	26,038	28,274	66,875	67,692	73,506
Japan (yen)	2,893	3,098	3,598	7,521	8,052	9,355
Netherlands (guilder)	42.28	45.53	50.09	109.92	118.36	130.22
South Africa (rand)	35.46	35.75	27.75	92.18	92.95	72.15
Spain (peseta)	2,384	2,510	2,492	6,198	6,525	6,479
Sweden (krona)	120.88	126.65	128.49	314.27	329.27	334.06
Switzerland (franc)	31.37	33.56	37.23	81.55	87.25	96.78
UK (pound)	11.14	11.68	11.58	28.97	30.36	30.10
US (dollar)	17.25	17.25	14.25	44.85	44.85	37.05

TRANSACTION VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb. U_3O_8 in Concentrates			per kg. U in Concentrates		
	This Month (Apr 30, 1986)	Last Month (Mar 31, 1986)	12 Months Ago (Apr 30, 1985)	This Month (Apr 30, 1986)	Last Month (Mar 31, 1986)	12 Months Ago (Apr 30, 1985)
Australia (dollar)	23.11	23.43	22.71	60.08	60.91	59.05
Belgium (comm. franc)	756.30	796.76	931.83	1,966	2,071	2,423
Canada (dollar)	23.58	23.32	20.37	61.30	60.63	52.97
Finland (markka)	84.24	86.48	96.69	219.00	224.84	251.37
France (franc)	118.42	119.71	141.64	307.87	311.23	368.22
FRG (mark)	37.18	38.91	46.39	96.66	101.16	120.60
Italy (lira)	25,500	25,208	29,563	66,293	65,543	76,858
Japan (yen)	2,868	2,999	3,763	7,455	7,796	9,782
Netherlands (guilder)	41.91	44.08	52.37	108.96	114.59	136.16
South Africa (rand)	35.15	34.61	29.02	91.38	89.98	75.44
Spain (peseta)	2,363	2,430	2,606	6,144	6,317	6,775
Sweden (krona)	119.83	122.61	134.36	311.54	318.77	349.29
Switzerland (franc)	31.10	32.49	38.92	80.84	84.47	101.19
UK (pound)	11.05	11.31	12.10	28.72	29.39	31.47
US (dollar)	17.10	16.70	14.90	44.46	43.42	38.74

[1]Calculated using currency exchange rates published in the *Wall Street Journal* on April 30, 1986.

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CURRENT MARKET DATA

CONVERSION VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb. U as UF_6			per kg. U as UF_6		
	This Month (Apr 30, 1986)	Last Month (Mar 31, 1986)	12 Months Ago (Apr 30, 1985)	This Month (Apr 30, 1986)	Last Month (Mar 31, 1986)	12 Months Ago (Apr 30, 1985)
Australia (dollar)	2.57	2.53	2.29	5.66	5.57	5.04
Belgium (comm. franc)	84.03	85.88	93.81	185.26	189.33	206.81
Canada (dollar)	2.62	2.51	2.05	5.78	5.54	4.52
Finland (markka)	9.36	9.32	9.73	20.63	20.55	21.46
France (franc)	13.16	12.90	14.26	29.01	28.45	31.43
FRG (mark)	4.13	4.19	4.67	9.11	9.25	10.30
Italy (lira)	2,833	2,717	2,976	6,246	5,990	6,561
Japan (yen)	318.63	323.22	378.79	702.46	712.57	835.08
Netherlands (guilder)	4.66	4.75	5.27	10.27	10.47	11.62
South Africa (rand)	3.91	3.73	2.92	8.61	8.22	6.44
Spain (peseta)	262.58	261.89	262.33	578.88	577.38	578.34
Sweden (krona)	13.31	13.22	13.53	29.35	29.14	29.82
Switzerland (franc)	3.46	3.50	3.92	7.62	7.72	8.64
UK (pound)	1.23	1.22	1.22	2.71	2.69	2.69
US (dollar)	1.90	1.80	1.50	4.19	3.97	3.31

SWU VALUE AND UF_6 VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	SWU Value delivery within one year (April 30, 1986)	UF_6 Value per kg.U in UF_6 This Month (April 30, 1986)	UF_6 Value per kg.U in UF_6 Last Month (March 31, 1986)
Australia (dollar)	108.11	65.54	67.34
Belgium (comm. franc)	3,538	2,145	2,290
Canada (dollar)	110.31	66.88	67.03
Finland (markka)	394.09	238.92	248.58
France (franc)	554.02	335.87	355.09
FRG (mark)	173.95	105.46	111.84
Italy (lira)	119,296	72,323	72,452
Japan (yen)	13,416	8,133	8,619
Netherlands (guilder)	196.08	118.87	126.68
South Africa (rand)	164.44	99.69	99.48
Spain (peseta)	11,056	6,703	6,984
Sweden (krona)	560.62	339.87	352.42
Switzerland (franc)	145.48	88.20	93.39
UK (pound)	51.68	31.33	32.50
US (dollar)	80.00	48.50	48.00

[1]Calculated using currency exchange rates published in the *Wall Street Journal* on April 30, 1986.

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RECENT TRANSACTIONS[1]

Uranium Sales

Nuexco Transaction Number	Delivery Period	Approximate Quantity (thousands of pounds, U_3O_8 equivalent)	Approximate Price as Percent of Current Exchange or UF_6 Value	Seller	Buyer	Remarks
3722	1986	101-300	101	R[5]	US Utility	UF_6.
3716	1986	301-600	101	US Producer	European Utility	
3715	1987	601-1,000	101-103	R[5]	US Utility	UF_6.
3714	1986	50-100	100	US Producer	European Utility	
3713	1986	less than 50	99	Fabricator	European Utility	UF_6.
3701	1986	101-300	97	Trader	European Utility	UF_6.

Conversion Services
Secondary Market Sales

Nuexco Transaction Number	Delivery Period	Approximate Quantity (thousands of pounds, U equivalent)	Approximate Price as Percent of Current C.V.	Seller	Buyer	Remarks
3717	1986	101-300	95-100	R[5]	US Utility	
3702	1986	50-100	R[5]	Trader	European Utility	

Enrichment Services
Secondary Market Sales

Nuexco Transaction Number	Delivery Period	Approximate Quantity[2] (thousands of SWUs)	Approximate Price[3] as Percent of Current SWU Value[4]	Seller	Buyer	SWU Origin	Remarks
3721	1986	less than 50	96-98	R[5]	European Utility	R[5]	
3707	1986	less than 50	101	US Utility	Trader	DOE	
3700	1986	less than 50	100	US Utility	US Utility	DOE	

[1]Transactions listed are not limited to those in which Nuexco was involved, but also include others of which Nuexco is aware.
[2]If tails assay is unknown or unspecified, Nuexco's calculation of SWU quantity assumes 0.20 w/o tails assay.
[3]Price is not normalized to 0.20% tails assay.
[4]Refers to SWU Value that corresponds to SWUs included in transaction. When prices and SWU values are expressed as discounts (e.g. X dollars less than DOE's USEC base price at time of delivery), the percentage refers to the ratio of the *discounts*, not the ratio of the prices.
[5]The notation *R* means that Nuexco either does not know, or that Nuexco has restricted that information to protect client confidentiality.

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CURRENT MARKET DATA

URANIUM SUPPLY
(April 30, 1986)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U_3O_8) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Available for Sale:			
ACTIVE			
2335	400	—	
2740	175	—	
2777*	500	—	
2810*	195	175	UF_6
2813*	70	—	
2826*	160	—	UF_6
2919*	40	—	
2933*	300	300 per year	
3023	750	500	UF_6
2263		400 per year	1987 on
2625	—	500 per year	1987 on
2778	—	220 per year	1987-90
2781	—	100 per year	1988-95
TOTAL	2,590		
INACTIVE			
2336	250	250 per year	1986-94
2389	75	75 per year	1986-90
2703	750	—	
2764	260	—	UF_6
2765	260	—	UF_6
2851*	70	—	
2853	65	—	
2871	50	—	
2297	—	200 per year	1986-89
TOTAL:	1,780		

*New or revised since last month.
[1]Measured from the date of this Report.
[2]For delivery within one year. This category excludes material deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 2728, 2802, 2838.

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URANIUM DEMAND
(April 30, 1986)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U_3O_8) Spot or Near-term[2]	Intermediate or long-term	Remarks
Inquiries to Purchase:			
ACTIVE			
2806	200	—	
2858*	750	—	UF_6
2930	250	—	UF_6
2943*	25	—	UF_6
2217	—	1,000 per year	1989-95
2507	—	600	1987-89
2586	—	250 per year	1988-95
2681	—	500 per year	UF_6 or U_3O_8; 1987-88
2738	—	1,000	1989 on
2760	—	750 per year	1987-90
2770	—	500 per year	1988-94
2782	—	900	1988
2821	—	120 per year	1988-93
2850	—	300 per year	1990-95
2870	—	100	1989
2915*	—	25 per year	1990-94
TOTAL:	1,225		
INACTIVE			
2661*	250	250 per year	1986-87
2733	500	500 per year	1987-95
2784	100	—	
2798	70	—	
2845*	400	—	
TOTAL:	1,320		

*New or revised since last month.

[1]Measured from the date of this Report.

[2]For delivery within one year. This category excludes material deliverable within one year under other than spot or near-term contracts.

Projects removed since last month: 2548, 2743, 2786, 2808.

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CURRENT MARKET DATA

LOAN SUPPLY AND DEMAND
(April 30, 1986)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U_3O_8) Within 1 Year	Beyond 1 Year	Remarks
Available for Loan:			
INACTIVE			
1938	2,000	—	UF_6
2036	500	—	
2667	800	—	
2920*	2,000	—	
TOTAL:	5,300		

*New or revised since last month.
[1]Measured from the date of this Report.
Projects removed since last month: 2805.

No inquiries to borrow are reported this month.

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CONVERSION SUPPLY AND DEMAND
(April 30, 1986)

Nuexco Project Number	Delivery Period[1] (Thousands of Pounds U as UF_6) Within 3 Years	Beyond 3 Years	Remarks
Available for Sale:			
ACTIVE			
2717	175	—	
2826B*	100	—	
2849*	550	500	1987-90
TOTAL:	825		
Inquiries to Purchase:			
ACTIVE			
2833	400	—	
2920B*	165	—	
2925*	60	—	
TOTAL:	625		

*New or revised since last month.
[1]Measured from the date of this Report.
Projects removed since last month: 2865, 2874, 2882.

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CURRENT MARKET DATA

SWU SUPPLY AND DEMAND
(April 30, 1986)

Nuexco Project Number	Delivery Period[1] (Thousands of SWUs) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Available for Sale:			
ACTIVE			
2571	—	55	1987
2873	40	—	
2914*	15	—	
2953*	200	—	
TOTAL:	255		
INACTIVE			
2410A	340	—	
TOTAL:	340		
Inquiries to Purchase:			
ACTIVE			
2879*	150	—	
TOTAL:	150		
INACTIVE			
3024*	10	—	
TOTAL:	10		

*New or revised since last month.
[1]Measured from the date of this Report.
[2]For delivery within one year. This category excludes SWUs deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 2844.

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1986 WORLD URANIUM PRODUCTION FORECAST

Introduction

Nuexco expects world uranium production to increase to 93.0 million pounds U_3O_8 in 1986. This represents a four-percent or approximately 3.4 million pound increase over the 1985 level of 89.6 million pounds. In general, anticipated decreases in production by most African producers should be offset by increases in production in Australia, Canada and the USA. Table 1 compares the 1986 forecast with actual production figures for 1984 and 1985.

Australia and Canada

Nuexco expects Australian production levels to move slightly closer to capacity (10.8 million pounds U_3O_8) than in 1985. However, unresolved water problems and a brief labor dispute at Energy Resources of Australia's (ERA) Ranger operation may hold output to somewhat less than full capacity.

In Canada, a small increase in production is expected at Saskatchewan Mining Development Corporation's Key Lake operation as it approaches its capacity production level of 12 million pounds U_3O_8 per year. Eldorado Resources Ltd. should increase its output as higher grade ores from the Collins Bay "B" deposit replace those of the mined-out Rabbit Lake deposit. No major changes are foreseen for Ontario producers.

Africa

From 1981 through 1985, uranium production decreased steadily in Gabon, Namibia and Niger, dropping from 24.3 million pounds U_3O_8 in 1981 to 19.6 million pounds in 1985. Table 2 gives production figures for those countries during that period. It is likely that the current market conditions for uranium do not provide sufficient incentive for these producers to increase their output. In addition, increasing upward pressure on production costs will continue to constrain the quantities produced.

Following the shutdown of operations at many of South Africa's higher-cost production sites over the past few years, U_3O_8 production probably will stabilize in the 12-13 million pound range for the foreseeable future. Political, labor and economic pressures, however, could reduce these expectations and the recent declines in production may continue.

United States and Other Nations

The expected increase in uranium production in the USA is attributable to a resurgence of conventional production from two major sources.

1. The reopening of the Energy Fuels/Union Carbide White Mesa mill, which will process high-grade ores from Energy Fuels' breccia pipe deposits in northern Arizona. Production from this source could approach 6,000,000 pounds U_3O_8 in 1986, which would make Energy Fuels the largest US producer. A substantial portion of this increase can be attributed to ore stockpiled during 1984 and 1985.

2. The commencement of sustained production from Chevron's Mount Taylor project (see Report 212, April 1986), which could average 1.5 million pounds per year from high-grade ores through the early 1990s.

No major changes are expected for European producers. Forecasts for other nations (including Argentina, Belgium, Brazil, France, Portugal, and Spain) show little change, with the exception of Argentina. The Argentine government's proposed closure of the Marlague operation could reduce the nation's production capacity to about 400,000 pounds U_3O_8 per year, down from 600,000 pounds annually. Overall, Nuexco expects that low uranium prices will continue to exert pressure on the higher-cost producers and that lower-cost producers will gain an increasing share of future production.

Table 1

WORLD URANIUM PRODUCTION
(Millions of Pounds U_3O_8)

Country	1984	1985	1986[1]
Australia	10.3	8.5	8.8
Canada	29.0	28.3	29.7
France	8.2	8.0	8.0
Gabon	2.3	2.3	2.2
Namibia	9.6	9.0	8.6
Niger	8.5	8.3	7.9
South Africa	14.9	12.7	12.3
United States	14.9	11.1	14.1
Other[2]	1.7	1.4	1.4
TOTAL	99.4	89.6	93.0

[1]Nuexco forecasts.
[2]Includes Argentina, Belgium, Brazil, Portugal, and Spain.

Table 2

HISTORICAL URANIUM PRODUCTION IN CENTRAL AFRICA AND NAMIBIA
(Millions of Pounds U_3O_8)

Country	1981	1982	1983	1984	1985	1986[1]
Gabon	2.7	2.5	2.6	2.3	2.3	2.2
Namibia	10.3	9.8	9.7	9.6	9.0	8.6
Niger	11.3	11.1	8.9	8.5	8.3	7.9
TOTAL	24.3	23.4	21.2	20.4	19.6	18.7

[1]Nuexco forecasts.

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RECENT DEVELOPMENTS

AUSTRALIA

In an unexpected move, Pioneer Concrete Services, Ltd. the parent company of Queensland Mines Ltd. (QML), announced an agreement with North Broken Hill Holdings to acquire the 31-percent share of Energy Resources of Australia (ERA) held by North Broken Hill for about US$164.5 million. Table 3 shows the revised ERA ownership structure, provided the transaction obtains the approval of the shareholders.

The Japanese, German and Swedish shareholders, which together own 25 percent of ERA, receive about 75 percent of the nominal annual output of 6.6 million pounds U_3O_8, and have the right to purchase 75 percent of increased production resulting from any expansion. The price that ERA received from these shareholders/customers was reduced to US$30.09 per pound U_3O_8 effective in 1985. For the purpose of those supply contracts, the price was frozen at the level of the Australian floor price in early 1980. Prior to 1985, prices were fixed at higher levels (as high as US$38.00 per pound U_3O_8) as required by agreements with the lenders that provided the Ranger project financing. It has been reported that for 1985 and later years, delivery prices are related to spot market levels, subject to the Australian floor. Moreover, the buyers earn credits to the extent that spot prices are below the floor price; such credits can be utilized to reduce future delivery prices if, as and when spot prices again exceed the floor price.

Table 3

POTENTIAL OWNERSHIP STRUCTURE OF ERA[1]

Shareholder	Country	Percent Ownership
PEKO-Wallsend Operations, Ltd.	Australia	32.61[2]
Pioneer Concrete Services, Ltd.	Australia	30.96
Japan Australia Uranium Resources Development Company Ltd.	Japan	10.00
Rheinbraun Australia	FRG	6.25
Urangesellschaft Australia Pty. Ltd.	FRG	4.00
Interuranium Australia	FRG	3.75
Oskarshamnverkets Kraftgrupp AG (OKG)	Sweden	1.00
Public Shareholders		11.43
		100.00

[1]Subject to shareholder approval of North Broken Hill sale.
[2]Includes approximately 0.8 percent purchased by PEKO-Wallsend from public shareholders in April 1986.

ERA also has two supply agreements with Korea Electric Power Company, and others with Synatom, Wisconsin Electric Power Company, American Electric Power Company, Virginia Electric Power Company, and Pennsylvania Power and Light Company. Though not officially announced, agreements are also in place with two other US utilities, and at least two other agreements may be approaching conclusion.

The decision to take a minority equity interest in ERA is a clear indication that Pioneer was convinced that substantial values exist, and if so, the move represents a vote of confidence in the future prospects of both ERA and the Australian uranium industry. However, the actual situation may be more complicated. As in the USA and other nations, Australia's major corporations have become targets of aggressive investors, typically intent on taking control and redeploying assets with a view towards enhancing shareholder values. North Broken Hill's proposed sale of its ERA interest is actually part of an asset divestment program stemming from a desire to remain independent. Pioneer's proposed acquisition of the ERA interest might be similarly motivated. By incurring the substantial debt needed to purchase the ERA shares, Pioneer would make itself a less attractive takeover target.

Some analysts have noted the obvious conflicts of interest:

— Pioneer would own 31 percent of ERA while at the same time owning QML, ERA's direct competitor in Australia.

— Pioneer would have representatives on the Board of Directors of ERA, privy to ERA's private deliberations. There is speculation that by selling QML, Pioneer would avoid the conflict of interest. Moreover, by divesting itself of QML (an important cash generator) Pioneer would make itself even less attractive to unfriendly investors. Finally, if QML was sold to ERA, Pioneer could accomplish those goals *and* retain a partial interest in QML.

JAPAN

In Report 212 (April 1986), Nuexco reported the outcome of annual uranium price negotiations between some Japanese utilities and South Africa's Nuclear Fuels Corporation (NUFCOR). The utilities agreed to pay approximately US$30.50 per pound U_3O_8 for deliveries during 1987, a reduction of about $2.00 from the previous year's negotiated price. Shortly thereafter, Tokyo Electric Power Corporation and six other Japanese utilities also concluded their annual price negotiations for deliveries under long-term supply contracts with Namibia's Rossing Uranium Limited. Rio Tinto Zinc is the project's operator and largest shareholder. For deliveries during 1987, the utilities agreed to pay slightly less than US$32.00 per pound U_3O_8. This represents a reduction of about $1.00 per pound U_3O_8 from the price paid for the previous year's deliveries.

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Reports indicated that the Rossing owners sought a price of approximately $33.00, equal to the 1986 negotiated price. However, the low uranium spot prices prevalent during 1985, combined with decreasing petroleum prices, undoubtedly had a strong impact on the negotiations. In addition, the $2.00 drop in the negotiated price between NUFCOR and some Japanese utilities for 1987 deliveries may have given the utilities a more favorable position in the negotiations with the Rossing representatives.

SOUTH AFRICA

First quarter 1986 uranium production from Chamber of Mines producers totaled 2,983,000 pounds U_3O_8, a four-percent decline from the fourth quarter of 1985 (Table 4). The decline was due chiefly to lower production at Randfontein (a 9-percent drop) and Western Areas (a 13-percent drop) following labor disputes. In addition, production fell 18 percent at Buffelsfontein because of a shortage of underground working face in the Strathmore shaft area. Production remained virtually constant at most of the other operations. Nuexco expects 1986 uranium production in South Africa to total approximately 12.3 million pounds U_3O_8.

UNITED STATES

Ferret Exploration Company of Nebraska announced that it has entered into an agreement to purchase the Wyoming Fuel Company ownership interest in the Crow Butte Joint Venture uranium project near Crawford, Nebraska. The project, formed in 1979, had been owned by Wyoming Fuel Company (50 percent), Ferret Exploration Company (40 percent), and First Exploration Company (10 percent). The transaction will increase Ferret Exploration's interest to 87.5 percent of the joint venture, and First's interest to 12.5 percent. Neither Wyoming Fuel nor its parent company, Kansas-Nebraska (K N) Energy, Inc., has commented publicly regarding the reasons behind the sale of the interest in Crow Butte or the price involved.

Wyoming Fuel acquired a regional lease position of about 64,000 acres in northwestern Nebraska in 1978. The lease position was acquired to explore for sandstone uranium mineralization. Wyoming Fuel and Ferret Exploration formed the joint venture in 1979, and Wyoming Fuel, as project operator, undertook a regional exploration drilling program. The Crow Butte deposit was discovered in the fall of 1980. In 1981, based on 127 holes drilled within the mineralized trend, a news release stated that probable potential reserves exceeded 25 million pounds

Table 4

REPUBLIC OF SOUTH AFRICA
RECENT URANIUM PRODUCTION[1]
(Thousands of Pounds U_3O_8)

Operation	Fourth Quarter 1985	Total 1985	First Quarter 1986
Buffelsfontein	428	1,573	353
Chemwes (Stilfontein)	139	595	137
Driefontein Consolidated	48	191	41
ERGO[2]	95	346	91
Harmony	234	940	231
Hartebeestfontein	240	944	238
JMS[3]	310	1,328	318
Randfontein	371	1,343	339
Vaal Reefs	1,059	4,151	1,082
Western Areas	178	687	155
TOTAL[4]	3,102	12,218	2,983

[1]Excludes Palabora Mining Company, which is not a member of the Chamber of Mines.
[2]ERGO = East Rand Gold and Uranium Co. Ltd.
[3]JMS = Free State Joint Metallurgical Scheme.
[4]Columns may not add due to rounding.

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U_3O_8. First Exploration Company, a subsidiary of Ferret, obtained a ten-percent ownership interest in the venture.

The deposit will be mined using the *in-situ* leach method. In early 1983, the partners filed permit applications with the Nuclear Regulatory Commission (NRC), the Environmental Protection Agency (EPA), and the Nebraska Department of Environmental Control (DEC). All permits were granted by early 1985, enabling the project operators to begin construction on a pilot plant for experimental leaching. The partners had begun marketing both the projected output and equity participation in the project to fund the startup of operations. Such an equity participation arrangement with another organization may be close to conclusion. The pilot plant is almost complete, and officials expect operation to begin in June 1986. The conclusion of the sale of Wyoming Fuel's interest is pending based on NRC and state acceptance of the permit and license transfer from Wyoming Fuel to Ferret Exploration Company of Nebraska, the new operator.

USSR

On or around April 26, an explosion and fire occurred at one of the two 1,000-MWe light-water-cooled, graphite-moderated (RBMK-1000) nuclear units at the Chernobyl Station, leading to a large radioactive release. The station is located 80 miles north of Kiev and includes the two RBMK-1000 units as well as two 1,000-MWe PWRs. The RBMK-1000 consists of a uranium core inside of a graphite bed that moderates the reaction, and a series of zirconium alloy tubes that carry the cooling water through the graphite bed.

As of press time, the causes and details of the nuclear accident at the Chernobyl station are neither complete nor clear. However, based on fragmentary reports, expert opinion and analysis of fallout, it is evident that the accident is orders of magnitude more serious than the 1979 accident at Three Mile Island (TMI) Unit 2. Official and unofficial reports of the extent of damage, number of casualties, remedial actions, and potential long-term effects of the Chernobyl accident have varied widely. Moreover, the Soviet reluctance to report openly and accurately on the matter has resulted in increased speculation, curiosity, and fear. Understandably, this has led to enormous media attention which generally has been negative towards nuclear power.

Even while lacking accurate information about the details of the accident, it is appropriate to comment on some of the likely consequences of this event. Like the 1979 accident at TMI, the Soviet disaster has become a media event, particulary on television. There have been extensive news reports showing weather maps with potential fallout patterns, speculation from nuclear experts and health physicists regarding causes and effects of the accident and briefings from government officials concerning the political consequences. Public attention has been refocused on the dangers of nuclear power with little balancing commentary on its benefits or the significant differences between the Soviet program and those in the rest of the world.

Once again the nuclear industry has been put in a defensive position, as opponents of nuclear power force the industry to explain why such an event could not happen in any other country. Public involvement will result in increased political and regulatory attention, and various groups will compete with one another to offer new solutions, new safety measures, and new regulations. Undoubtedly, new committees will be formed and new studies commissioned as political structures attempt to demonstrate to their constituencies that they are concerned and are responding to the matter.

That response is likely to affect the nuclear industry without regard to the particular facts and circumstances of the Chernobyl accident. Ultimately, the specific technical details of the accident may be of little consequence other than to nuclear industry scientists and engineers. The *perceived* facts that will force action are

— the fact that an accident occurred, and it occurred near a major population center,

— the radioactive release and fallout were substantial, and the fallout has crossed international boundaries, and

— officials in the USSR have chosen to disclose only the slightest details of the accident to the rest of the world.

Within the commercial nuclear power industry, it is likely that nuclear units that have not yet entered commercial operation will be the most vulnerable to the renewed anti-nuclear campaign. These include planned units, units under construction, and completed units in various stages of licensing. Most susceptible are those units nearing commercial operation. Nuexco anticipates that previously established emergency evacuation plans will undergo considerable scrutiny, and many such plans may be judged inadequate as more details about the radiation release at Chernobyl are confirmed. Evacuation plans determined to be inadequate will defer operation dates by at least months, and in some cases years. Abandonment of one or more completed plants is a possibility. Other units at risk include those that are planned but are not yet under construction because of opposition from various sources.

Nuexco estimates that reactors representing more than 20,000 MWe worldwide are likely to experience near-term delays that will affect uranium demand. Included in that figure are reactors representing nearly 5,000 MWe that might be canceled outright. For the uranium market, which was experiencing a slow, gradual recovery from record low price levels, the Chernobyl accident is another factor impeding recovery. Any delays in reactor operations lead to reductions in projected uranium consumption. In

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addition, as carrying charges on unfinished plants increase, utility inventory sales of uranium become more likely. Any plant cancellations or abandonments by utilities having only one reactor planned or under construction would also trigger inventory sales. Uranium buyers are apt to react to this situation by waiting to see if prices weaken. Because the majority of current demand is discretionary in nature, the price recovery that was in progress could be arrested or reversed if buyers defer purchasing decisions. Similarly, long-term buyers might reevaluate the timing of their market entry. Producers will undoubtedly resist lower prices, either in the spot or longer-term markets. The different motivations of inventory sellers, however, could pressure some into liquidating inventories rather than waiting for the next market turn.

The accident is clearly a setback for the nuclear power industry and its suppliers of materials and services, and the following results are likely.

1. There will be some additional reactors delays with the potential for a few cancellations.

2. Some uranium demand will be deferred.

3. Some additional inventory liquidations will take place, but they should be modest compared to those initiated by the TMI accident.

4. The upward price movement of the last twelve months is likely to be interrupted, and price weakening in the near term is possible until the supply-demand balance is realigned.

AMPLIFICATIONS

In the article on World Uranium Resources in Report 211 (March 1986), the section on Australia's resources contained some misleading information.

1. "*Uranium Mining — The Australian Environment,*" by P.J. Bradfield, presented at the AIF Symposium on October 1, 1985, has not been recognized as the *official* source of Australian resource data, as Nuexco indicated. The official source of such data is Australia's Bureau of Mineral Resources (BMR). However, BMR's published data is aggregated, so it does not separate individual deposits into cost categories. Consequently, the classification of the Olympic Dam resources included in the various cost categories have no official basis.

2. As stated by the project's partners, the probable reserve figure for Olympic Dam is 397,000 tons U_3O_8. Moreover, uranium and copper are to be co-products of the project; neither will be secondary to the other.

3. Finally, there is no basis for believing that Australia's resources in the less than $30 per pound U_3O_8 category are any more suspect than those of other countries. However, factors other than cost may exert a significant influence over the exploitation of those resources.

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UPDATE

SAFEGUARDS AND THE INTERNATIONAL URANIUM MARKET

Introduction

The Nuclear Nonproliferation Treaty (NPT) and the system of nuclear material accountability set up by the International Atomic Energy Agency (IAEA) comprise the basic groundwork for international cooperation in the nuclear industry. Stemming from a desire to reduce the proliferation of nuclear weapons and to promote the peaceful uses of atomic energy, various nations cooperated in bringing about an organized way to reach these and other goals. This update focuses on the current state of the Nuclear Nonproliferation Treaty, IAEA safeguards, and their effect on uranium commerce worldwide.

History of International Nuclear Cooperation

Under the Atoms for Peace program initiated by the USA in the early 1950s, the first policies of international cooperation in the peaceful uses of atomic energy were established. The US Congress, through the Atomic Energy Act of 1954, authorized the export of US uranium, other nuclear material, and nuclear equipment and technology, provided that the USA was able to establish strict safeguards to insure that there was no diversion of nuclear material from peaceful to military uses. The formation of the IAEA by international agreement led, in the early 1960s, to a program of nuclear material safeguards inspections which would be made available to member nations upon request. Soon thereafter the USA, which had adopted a series of bilateral agreements with other nations, shifted its safeguards responsibilities to the IAEA.

The Nonproliferation Treaty

The NPT was opened for signature by resolution of the United Nations in July 1968 and went into effect for members in March 1970, after ratification by forty non-nuclear weapon States. The basic provisions of the NPT are contained in Articles I and II. Article I applies to the nuclear weapon States, i.e. a nation which had exploded a nuclear weapon before January 1, 1967. The USA, the United Kingdom, USSR, France and the People's Republic of China are nuclear weapon States. In part, Article I states as follows:

> Each nuclear-weapon State party to the Treaty undertakes not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices... and not in any way to assist, encourage, or induce any non-nuclear weapon State to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices...

Article II applies to non-nuclear weapon States. These nations agree not to receive explosive nuclear devices from any transferor whatsoever or to manufacture explosive nuclear devices. Article III underscores the inherent discrimination between nuclear weapon States and non-nuclear weapon States by requiring that non-weapon States be subject to on-site inspection for policing NPT terms. Nuclear weapon States are not subject to the inspections. Four of the five nuclear weapon States, however, have been willing to open their commercial nuclear facilities to on-site IAEA inspection, though they are not required to do so under the NPT. Non-nuclear weapons States that have signed the NPT are also required to execute an agreement with the IAEA to provide the safeguards specified under the treaty. The entire civilian nuclear program of those nations is required to be safeguarded by the IAEA. This requirement includes the safeguarding of facilities for *source material* (natural uranium), although in practice, the IAEA focuses on enriched uranium and plutonium.

The NPT also contains a provision which affects nations that are not parties to the Treaty. NPT members are not permitted to transfer nuclear material, including natural uranium, to non-nuclear weapon States unless that material is subject to IAEA inspection in the recipient State, whether or not the recipent State is a party to the NPT. In other words, if any party sold uranium to a non-member of the NPT, that uranium would have to be safeguarded by the IAEA during the entire time the uranium was retained in the recipient State, in whatever form it was used. Thus, since much of the world's uranium is produced by NPT members, the NPT has considerable influence on uranium commerce, even for those nations which have not become members. Any nation unwilling to comply with IAEA safeguards should be unable to purchase uranium from an NPT member.

These relationships can be illustrated by using some specific examples of international uranium commerce.

1. Gabon, an NPT member, sells natural uranium to the Federal Republic of Germany (FRG). The FRG is a non-nuclear weapon State and a party to the NPT. Therefore, the uranium will automatically be safeguarded while it is in the FRG, since the FRG's entire nuclear program is safeguarded under NPT obligations.

2. Gabon sells to Spain, which is not an NPT member. Spain's program is not subject to IAEA safeguards under the NPT. However, because Gabon is an NPT member, it is not permitted, under the terms of the NPT, to transfer uranium to Spain unless Spain agrees to put *that uranium* under IAEA safeguards. The safeguards required of Spain extend only to that uranium transferred from the NPT member (Gabon), and not to other aspects of Spain's nuclear program.

3. Gabon sells to France, a nuclear weapon State not party to the NPT. Even though Gabon is an NPT member, it may still sell to France without requiring that France submit that uranium to IAEA safeguards. France's status as a nuclear weapons State makes it exempt from provisions which would require Gabon to

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insist that any exported uranium be subject to IAEA inspection.

4. South Africa, not a member of the NPT, sells to Japan, which is a member. The uranium will be safeguarded because Japan's obligations under the Treaty require that its entire civilian nuclear program be safeguarded.

5. Argentina sells to Spain. Because neither nation is a party to the NPT, the uranium would not be safeguarded by the IAEA, unless the internal policy of either nation required it.

6. The USA sells to France. Under the NPT, this uranium would not have to be safeguarded, since France is a nuclear weapon State. However, the USA (as well as some other supplier nations) has internal laws requiring that uranium sold abroad be subject to IAEA safeguards or similar controls while it is in the recipient nation, whether or not that nation is a nuclear weapon State.

7. The USA sells to Spain. Spain is a non-nuclear weapons State, so US obligations under the NPT require that the uranium be safeguarded. In addition, US law requires such safeguarding of exported uranium.

Current Status of the NPT

The IAEA Annual Report for 1984 lists 129 parties to the Nonproliferation Treaty as of October 1985. Four additional nations have signed but not yet ratified the NPT. Three of the five nuclear-weapon States have signed the NPT (USA, United Kingdom, USSR); France and the People's Republic of China are the nuclear weapon States that have not signed the NPT. A State becomes party to the NPT on deposit of an instrument of ratification, accession, or succession from its national government to the NPT depository nations. The UK, USA and USSR are depository governments. Under the terms of the NPT, each non-nuclear weapon State signatory is also required to execute an agreement with the IAEA. This agreement provides the framework for implementation of the safeguards specified under the Treaty. By the end of 1984, there were a total of 163 safeguards agreements in force with 95 States.

Nations which have not signed the NPT can enter into safeguards agreements with the IAEA which cover all or part of the countries' nuclear activities. By placing their nuclear activities under IAEA inspection, these nations are allowed access to nuclear materials. NPT members can transfer nuclear material, including natural uranium to non-nuclear weapon States *only if* that material would be subject to IAEA inspection in the recipient State. Spain, Brazil, and Argentina are examples of non-nuclear weapon States which have IAEA safeguards agreements in place but have not signed the NPT.

A notable event that took place at the IAEA 29th General Conference in September 1985 was the statement by the Conference delegate from the People's Republic of China that the Chinese government has decided to voluntarily offer to place some of its civilian nuclear installations under IAEA safeguards "at an appropriate time." At present, four of the five nuclear weapons States — France, the United Kingdom, the USA and the USSR — have this type of voluntary-offer agreement in place with the IAEA.

Table 5 provides a summary of the NPT status and IAEA agreements status of most nations that participate in nuclear fuel transactions. Nuexco will update the status of the various bilateral safeguards in force worldwide in a later report.

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Table 5

UPDATE

NPT AND IAEA SAFEGUARDS STATUS WORLDWIDE[1]

Country	NPT Member as of	Safeguards Agreement in Force with the IAEA as of
Argentina		Mar 1970[2]
Australia	Jan 1973	Jul 1974
Austria	Jun 1969	Jul 1972
Belgium	May 1975	Feb 1977
Brazil		Oct 1968[3]
Bulgaria	Sep 1969	Feb 1972
Canada	Jan 1969	Feb 1972
China (People's Republic)		
Czechoslovakia	Jul 1969	Mar 1972
Egypt	Feb 1981	Jun 1982
Finland	Feb 1969	Feb 1972
France		Sep 1981[4]
Gabon	Feb 1974	Dec 1979
German Democratic Republic	Oct 1969	Mar 1972
Germany (Federal Republic)	May 1975	May 1975
Hungary	May 1969	Mar 1972
India		Nov 1977[2]
Iran	Feb 1970	May 1974
Iraq	Oct 1969	Feb 1972
Israel		see note[3]
Italy	May 1975	Feb 1977
Japan	Jun 1976	Dec 1977
Korea (Republic of)	Apr 1975	Nov 1975
Mexico	Jan 1969	Sep 1973
Netherlands	May 1975	Feb 1977
Niger		
Pakistan		Mar 1977[2]
Philippines	Oct 1972	Oct 1974
Poland	Jun 1969	Oct 1972
Portugal	Dec 1977	Jun 1979
Romania	Feb 1970	Oct 1972
South Africa/Namibia		see note[3]
Spain		Nov 1974[2]
Sweden	Jan 1970	Apr 1975
Switzerland	Mar 1977	Sep 1978
Taiwan	Jan 1970	see note[5]
Turkey	Apr 1980	Sep 1981
Union of Soviet Socialist Republics	Mar 1970	
United Kingdom	Nov 1968	Aug 1978[4]
United States	Mar 1970	Dec 1980[4]
Yugoslavia	Mar 1970	Dec 1973

[1]Table only includes nations that are likely to buy or sell uranium in the near future. The five nuclear weapon States are listed in italics. Status as of December 31, 1984.
[2]The agreements provide for safeguards other than those in connection with the NPT; i.e., project agreements or unilateral submissions.
[3]Some facilities or material under IAEA safeguards.
[4]Agreements concluded with nuclear weapon States on the basis of voluntary offers.
[5]The IAEA applies safeguards under two agreements to the nuclear facilities in Taiwan. The agreements are implemented by the IAEA on a non-governmental basis because of a 1971 ruling that the People's Republic of China is the only government which has the right to represent China in the IAEA.

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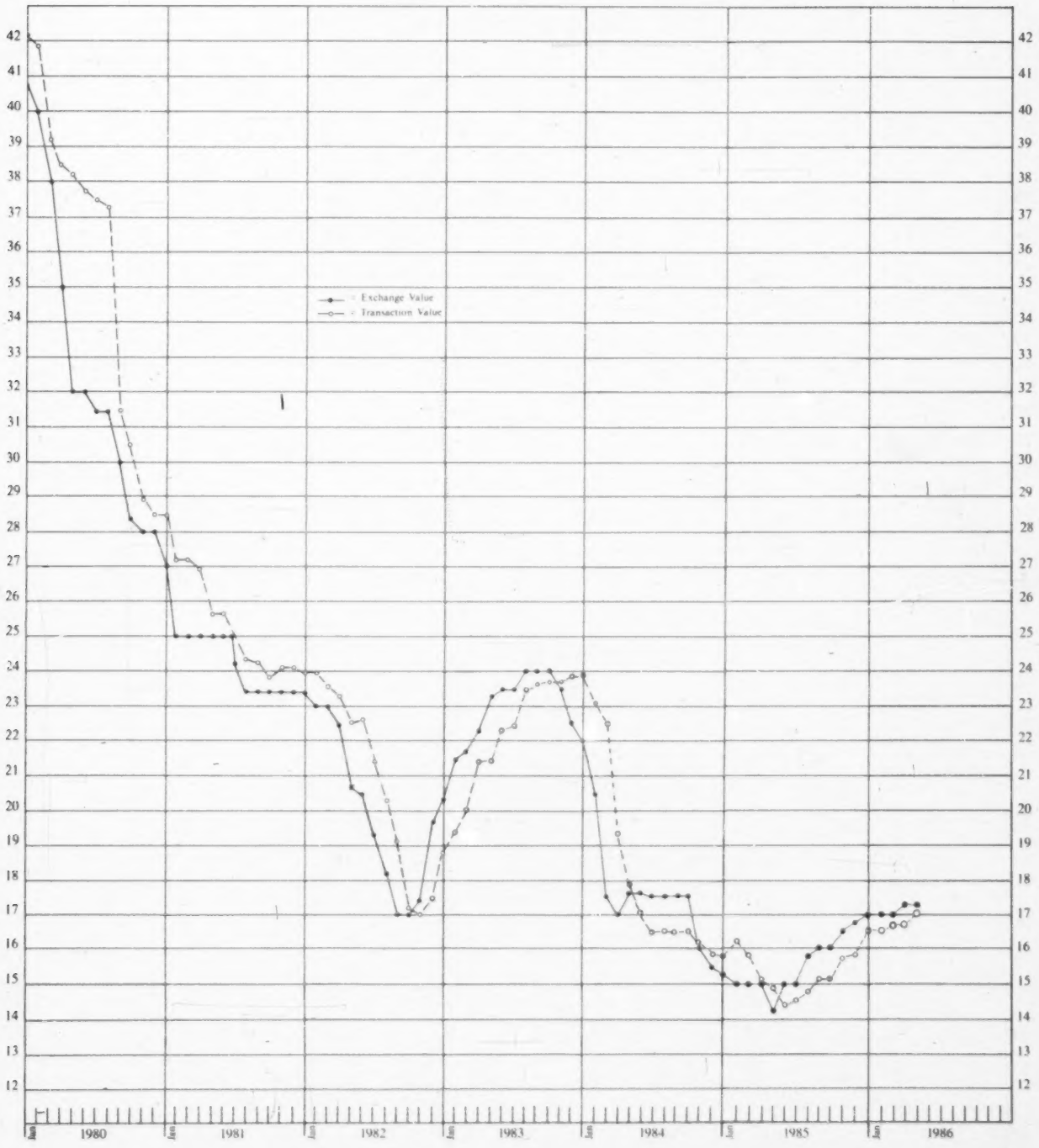
EXCHANGE AND TRANSACTION VALUES
SINCE JANUARY 1980

Determined as of the last day of the month indicated



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HISTORICAL MARKET DATA

HISTORICAL EXCHANGE VALUES

Determined as of the last day of the month indicated (US Dollars/lb. U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1968	—	—	—	—	—	—	—	6.35	6.35	6.40	6.45	6.50
1969	—	6.35	6.10	6.10	6.25	6.25	6.20	6.20	6.15	6.15	6.15	6.20
1970	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.20	6.15	6.15	6.15	6.15
1971	6.20	6.20	6.20	6.20	6.15	6.05	6.00	5.95	5.95	5.95	5.95	5.95
1972	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95
1973	5.95	6.00	6.10	6.20	6.45	6.50	6.50	6.50	6.50	6.50	6.75	7.00
1974	7.70	7.90	8.00	9.00	9.50	10.50	11.50	12.00	12.50	14.00	14.75	15.00
1975	16.00	16.00	18.00	20.00	21.00	23.00	24.70	26.00	26.00	28.50	30.00	35.00
1976	32.50	37.00	39.25	40.00	40.00	40.00	40.00	40.40	41.00	41.00	41.50	41.00
1977	41.35	41.50	41.60	41.60	42.00	42.25	42.25	42.25	42.40	42.75	43.20	43.20
1978	42.90	43.25	43.25	43.25	43.40	43.40	43.40	43.10	43.25	43.00	43.25	43.25
1979	43.25	43.25	43.25	43.25	43.25	43.00	42.70	42.70	42.20	42.20	41.00	40.75
1980	40.00	38.00	35.00	32.00	32.00	31.50	31.50	30.00	28.50	28.00	28.00	27.00
1981	25.00	25.00	25.00	25.00	25.00	24.25	23.50	23.50	23.50	23.50	23.50	23.50
1982	23.00	23.00	22.50	20.75	20.50	19.25	18.25	17.00	17.00	17.50	19.75	20.25
1983	21.50	21.75	22.25	23.25	23.50	23.50	24.00	24.00	24.00	23.50	22.50	22.00
1984	20.50	17.50	17.00	17.75	17.75	17.50	17.50	17.50	17.50	16.00	15.50	15.25
1985	15.00	15.00	15.00	14.25	15.00	15.00	15.75	16.00	16.00	16.50	16.75	17.00
1986	17.00	17.00	17.25	**17.25**								

HISTORICAL TRANSACTION VALUES

Determined as of the last day of the month indicated (US Dollars/lb. U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	—	—	—	—	39.60	39.70	39.70	40.40	40.30	40.60	40.70	40.70
1977	41.30	41.30	41.40	41.50	42.80	42.90	43.00	42.60	42.50	42.80	42.90	42.90
1978	43.10	43.30	43.70	43.60	43.60	43.20	43.30	43.40	43.40	43.60	43.40	43.70
1979	43.60	43.80	43.70	43.40	43.60	43.70	43.70	43.60	43.60	43.60	43.50	42.30
1980	42.00	39.30	38.60	38.40	37.90	37.60	37.30	31.60	30.60	29.00	28.70	27.70
1981	27.20	27.20	27.00	25.70	25.70	24.50	24.40	24.30	23.90	24.10	24.10	24.00
1982	24.00	23.70	23.40	22.60	22.70	21.50	20.30	19.10	17.30	17.00	17.55	18.80
1983	19.35	20.00	21.35	21.40	22.35	22.45	23.50	23.60	23.65	23.65	23.85	23.85
1984	23.05	22.50	19.25	17.90	17.00	16.50	16.60	16.40	16.55	16.05	15.90	15.90
1985	16.20	15.70	15.05	14.90	14.45	14.60	14.75	15.10	15.10	15.75	15.80	16.55
1986	16.55	16.70	16.70	**17.10**								

HISTORICAL CONVERSION VALUES

Determined as of the last day of the month indicated (US Dollars/lb. U in UF_6)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1981	1.20	1.20	1.20	1.40	1.15	1.15	1.15	1.10	1.10	1.10	1.20	1.20
1982	1.20	1.20	1.20	1.20	1.00	1.00	1.00	0.90	1.10	1.60	1.45	1.45
1983	1.20	1.40	1.40	1.20	1.20	1.20	1.10	1.10	1.00	0.60	0.60	0.60
1984	0.60	0.30	0.80	0.80	0.80	0.00	0.00	0.80	1.00	1.00	0.80	0.80
1985	1.00	1.00	1.00	1.50	1.50	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1986	1.60	1.80	1.80	**1.90**								

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AUSTRALIA

	Price Index of Materials Used in Manufacturing Industry — All Groups[1] (1984 = 100)	Award Rates of Pay Indexes Australia — Adult Males In Mining Wage Earners, Weekly Rates[2] (1976 = 100)
1975 Avg.	150.4	132.6
1976 Avg.	168.4	160.9
1977 Avg.	192.0	179.0
1978 Avg.[3 4]	198.5	190.0
1979 Avg.	248.8	127.9
1980 Avg.	321.8	140.8
1981 Avg.	355.3	154.1
1982 Avg.[5]	368.6	174.9
1983 Avg.	401.6	181.8
Jan 1984	94.6	188.5
Feb 1984	95.4	188.4
Mar 1984	95.7	188.2
Apr 1984	95.8	196.1
May 1984	95.7	197.3R
Jun 1984	95.9	197.7R
Jul 1984	96.7	197.7R
Aug 1984	97.9	197.7R
Sep 1984	97.6	197.7R
Oct 1984	96.8	197.8R
Nov 1984	96.4	197.8R
Dec 1984	96.2	197.8R
FY84 Avg.[6]	95.3	—
FY85 Avg.[6]	100.0	—
Jan 1985	97.0	197.8R
Feb 1985	98.6	197.8R
Mar 1985	102.1	197.8R
Apr 1985	104.4	202.8R
May 1985	107.6	202.8R
Jun 1985	108.7	202.8R
Jul 1985	111.0	202.8R
Aug 1985	110.5	202.8R
Sep 1985	108.9	202.8R
Oct 1985	109.6	202.8R
Nov 1985	109.6	210.2R
Dec 1985	110.2	210.3R
Jan 1986	109.8	210.3R
Feb 1986	—	210.3
Mar 1986	—	210.3

P = Preliminary R = Revised since last month

[1]Australian Bureau of Statistics, Canberra: "Price Index of Materials Used in Manufacturing Industry" (Catalogue No. 6411.0). The basis of this index was revised to 1984 = 100. The previous index was 1969 = 100.

[2]Australian Bureau of Statistics, Canberra: "Award Rates of Pay Indexes, Australia" (Catalogue No. 6312.0). Figures for the latest fourteen months shown are subject to revision.

[3]Monthly data for 1970-78 appear on pages 4.7 and 4.8 of Report 138.

[4]Annual averages prior to 1979 reflect index base no longer in use.

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[5]Monthly data for 1979-82 appear on page 35 of Report 184.

[6]Annual averages are for financial year ending June 30.

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GOVERNMENT STATISTICS

CANADA

	Industry Selling Price Index: All Commodities[1] (1981 = 100)	Wage-earner Data: Average Hourly Earnings (C$)[2] Uranium Mines (SIC 057)	Metal Mines (SIC 051-059)	Mines, Quarries and Oil Wells[3] (SIC 051-099)	Primary Non-ferrous Metal Industries[4] (SIC 296)	(SIC 298)	Chemicals and Chemical Products[5] (SIC 372-379)
1979 Avg.[6]	217.9	—	9.60	9.66	—	—	7.67
1980 Avg.	247.2	—	10.58	10.80	—	—	8.50
1981 Avg.	288.7	—	12.02	12.23	—	—	9.53
1982 Avg.[7]	288.8	—	13.74	13.92	—	—	10.63
1983 Avg.	298.8	—	—	14.30	—	—	11.17
Jan 1984	305.4	17.74	15.27	14.74	11.91	10.84	11.69
Feb 1984	306.6	17.90	15.59	14.90	12.04	10.82	11.51
Mar 1984	308.7	18.05	15.52	14.82	12.14	10.84	11.58
Apr 1984	310.5	18.06	15.83	15.10	11.96	10.34	11.63
May 1984	310.6	18.48	15.64	15.06	12.11	10.16	11.65
Jun 1984	311.0	18.08	15.48	14.80	12.38	10.40	11.66
Jul 1984	312.9	17.81	15.72	14.92	12.53	10.18	11.82
Aug 1984	312.7	17.24	15.36	14.92	12.44	10.34	11.78
Sep 1984	312.3	17.68	15.96	15.34	12.51	10.52	11.90
Oct 1984	312.3	17.64	16.15	15.26	12.69	10.56	11.96
Nov 1984	313.6	18.04	16.13	15.43	12.47	10.51	11.96
Dec 1984	314.2	17.95	16.39	15.60	12.16	10.40	11.99
1984 Avg.	310.9	17.88	—	15.07	12.28	10.49	11.76
Jan 1985	117.5	18.05	16.13	15.60	12.32	10.80	12.04
Feb 1985	117.7	18.78	16.41	15.68	12.52	11.05	12.06
Mar 1985	118.4	18.24	16.21	15.57	12.44	10.97	12.02
Apr 1985	118.3	18.63	16.44	15.80	12.81	11.23	12.04
May 1985	118.6	19.41	16.51	15.63	12.76	11.25	12.15
Jun 1985	118.6	18.49	16.20	15.49	12.89	11.14	12.14
Jul 1985	118.6	18.14	16.27	15.41	12.96	11.17	12.13
Aug 1985	118.4	17.07	16.03	15.30	12.97	11.31	12.19
Sep 1985	118.6	18.53	16.55	15.72	12.95	11.39	12.26
Oct 1985	118.9	18.74	16.51	15.70	13.14	11.53	12.33
Nov 1985	119.2	19.05	16.66	15.88	12.76	11.32	12.49
Dec 1985	119.9	19.07	16.57	16.01	12.51	11.09	12.59
Jan 1986	120.7	18.15R	16.27R	15.86R	13.02R	11.59R	12.50R
Feb 1986	120.5	19.64P	16.63P	15.98P	13.28P	11.39P	12.52P

P = Preliminary R = Revised since last month

[1]Statistics Canada, Prices Division, Ottawa: "Industry Price Indexes" (Catalogue 62-011). Indexes for the most recent six months shown are subject to revision. This category was formerly known as "Manufacturing." Index prior to 1985, 1971 = 100.

[2]Statistics Canada, Labour Division, Employment and Payrolls Section, Ottawa: "Employment, Earnings and Hours" (Catalogue 72-002).

[3]Reports 175 through 185 list this series title incorrectly as "Metal Mining, Including Milling (SIC 050-099)."

[4]Beginning with the April 1983 figure, Primary Metal Industries, non-ferrous is split into SIC 296 and SIC 298.

[5]Chemical and Chemical Products prior to April 1983 was SIC 370-379. The new series is from a new survey which includes all companies and is based on a 1970 classification. The old survey only included companies of 20 employees or more.

[6]Monthly ISPI for 1977 and 1978 appear on page 4.10 of Report 138, and monthly wage-earner data for 1973-78 appear on page 4.11 of Report 138.

[7]Monthly data for 1979-1982 appear on page 37 of Report 184. On that page, the wage earner index entitled "Metal Mining, Including Milling (SIC 050-099)" should read "Total Mining (SIC 051-099)."

[8]Beginning with the April 1983 figure, Wage Earner Data are based on a census of all companies employing 200 or more wage earners, *plus* a random survey of companies employing fewer than 200 wage earners. Prior to April 1983 only companies employing 200 or more wage earners are included in the Wage Earner Data.

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REPUBLIC OF SOUTH AFRICA

		Average Declared Working Costs per Metric Ton of Gold Ore Milled (Rand)[1]	Tonnage-Weighted Index of Average Working Costs per Metric Ton of Gold Ore Milled (March 1982 = 100)[2]	Consumer Price Index[3] (1980 = 100)[4]	Producer Price Index All Groups[5] (1980 = 100)	Total Employment in Mining and Quarrying (Code 35)[6]	Total Salaries and Wages in Mining and Quarrying (1,000 Rand) (Code 40)[6]
1975	Avg.	16.71	—	157.2	100.0	639,473	1,003,617
1976	Avg.	19.30	—	174.7	115.1	671,240	1,212,983
1977	Avg.	23.87	—	194.4	130.0	712,006	1,420,670
1978	Avg.	27.14	—	137.2	142.7	664,571	1,537,169
1979	Avg.[7]	30.18	—	155.?	164.5	692,209	1,830,632
1980	Avg.[8]	35.53	—	176.7	192.1	714,379	2,279,615
1981	Avg.	41.89	—	206.5	218.3	728,506	2,820,505
1982	Avg.[9]	47.25	104.2	233.5	248.7	707,552	3,246,071
1983	Avg.	51.87	115.0	262.2	274.8	696,579	3,644,772
Jan	1984	—	—	274.7	283.3	689,807	326,619
Feb	1984	—	—	278.4	286.5	702,553	335,906
Mar	1984	55.30	123.1	281.9	288.0	715,628	342,332
Apr	1984	—	—	286.1	290.2	712,963	327,550
May	1984	—	—	288.3	292.6	710,040	327,937
Jun	1984	56.95	126.2	291.2	295.3	717,009	347,121
Jul	1984	—	—	295.1	296.0	717,121	369,964
Aug	1984	—	—	297.0	300.8	721,905	361,357
Sep	1984	60.64	133.2	299.9	304.1	721,470	359,218
Oct	1984	—	—	303.7	308.7	717,865	363,755
Nov	1984	—	—	307.4	312.8	717,396	369,771
Dec	1984	62.92	138.6	309.4	315.9	701,198	365,234
Jan	1985	—	—	177.1	166.6	711,366	376,777
Feb	1985	—	—	182.8	171.3	727,932	361,823
Mar	1985	64.48	142.4	183.6	173.0	708,809	371,380
Apr	1985	—	—	187.4	174.0	724,187	369,005
May	1985	—	—	189.5	177.7	708,085	373,478
Jun	1985	67.42	148.9	191.9	179.2	724,587	395,543
Jul	1985	—	—	193.6	180.7	738,228	419,106
Aug	1985	—	—	195.6	183.2	734,121	416,777
Sep	1985	70.47	155.3	197.8	184.8	732,836	419,883
Oct	1985	—	—	200.8	188.1	720,071	401,448
Nov	1985	—	—	203.4	196.0	750,049	432,996
Dec	1985	72.43	160.1	207.4	199.4	741,372R	425,261
Jan	1986	—	—	213.8	203.6	—	—
Feb	1986	—	—	215.8	206.9R	—	—
Mar	1986	75.76	167.8	218.3	—	—	—

[1]Chamber of Mines of South Africa, Johannesburg; "Analysis of Working Results," published quarterly.

[2]Page 16 of Report 178 contains description and calculation of index, and page 24 of Report 178 lists figures for 1982.

[3]Republic of South Africa Department of Statistics, Pretoria; "Government Gazette: Consumer Price Index for Urban Areas."

[4]The basis for calculation prior to January 1985, 1975 = 100. For annual averages prior to 1978, April 1970 = 100.

[5]Previously known as the Wholesale Price Index, now the Producer Price Index. The computation remains the same. The basis for calculation prior to January 1985, 1975 = 100.

[6]Bulletin of Statistics, Department of Statistics, Pretoria.

[7]Historical data for the Average Declared Working Costs and Consumer Price Index 1970-1979 appear on page 4.9 of Report 140.

[8]Monthly data for Codes 35 and 40, 1977-1980, appear on page 28 of Report 157.

[9]Monthly data for 1979-82 appear on page 39 of Report 184.

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GOVERNMENT STATISTICS

UNITED STATES

	Producer Price Index[1]		Consumer Price Index[2]	GNP Implicit Price Deflator[3,4]	Gross Average Hourly Earnings of Production or Non-supervisory Workers (US$)[5]			
	Industrial Commodities (1967 = 100)	All Commodities (1967 = 100)	(1967 = 100)	(1982 = 100)	Metal Mining (SIC 10)	Primary Non-ferrous Metals (SIC 333)	Chemicals and Allied Products (SIC 28)	Electric and Electronic Equipment (SIC 36)
1980 Avg.[6]	274.8	268.8	246.8	178.64	10.26	10.63	8.30	6.94
1981 Avg.	304.1	293.4	272.4	195.51	11.55	11.98	9.12	7.62
1982 Avg.[7]	312.3	299.3	289.1	207.15	12.33	12.94	9.96	8.21
1983 Avg.	315.8	303.1	298.4	215.63	12.57	13.43	10.59	8.65
1984 Avg.	322.6	310.3	311.1	108.1	13.05	13.43	11.08	9.04
Jan 1985	322.9	309.5	316.1	—	13.29	13.70	11.39	9.33
Feb 1985	322.5	309.2	317.4	—	13.30	13.73	11.39	9.33
Mar 1985	322.6	308.7	318.8	110.4	13.29	13.95	11.37	9.39
Apr 1985	323.8	309.3	320.1	—	13.43	13.62	11.48	9.40
May 1985	325.3	309.8	321.3	—	13.24	13.59	11.46	9.39
Jun 1985	324.8	309.2	322.3	111.3	13.23	13.66	11.52	9.46
Jul 1985	324.4	309.0	322.8	—	13.45	13.82	11.60	9.47
Aug 1985	323.7	307.3	323.5	—	13.55	13.69	11.62	9.50
Sep 1985	322.3	305.5	324.5	112.1	13.44	13.66	11.67	9.55
Oct 1985	324.2	307.9	325.5	—	13.49	13.64	11.72	9.56
Nov 1985	324.7R	309.5R	326.6	—	13.49	13.95	11.82	9.61
Dec 1985	325.2	310.2	327.4	113.0	13.43	13.78	11.87	9.68
Jan 1986	324.0	309.0	328.4	—	13.40R	13.67R	11.87R	9.61R
Feb 1986	319.4	304.7	327.5	—	13.43P	13.80P	11.82P	9.59P
Mar 1986	314.0	300.3	326.0	113.7P	—	—	11.79P	9.63P
Apr 1986	—	—	—	—	—	—	—	—

P = Preliminary R = Revised since last month

[1]US Bureau of Labor Statistics, Washington, D.C.: "Producer Prices and Price Indexes," (formerly "Wholesale Prices and Price Indexes"). Producer Price Indexes are revised four months after they are first released to reflect the availability of late reports and corrections by respondents.

[2]US Bureau of Labor Statistics, Washington, D.C.: Consumer Price Index for All Urban Consumers, US City Average, All Items.

[3]US Department of Commerce, Washington, D.C.: Bureau of Economic Analysis, National Income and Wealth Division: "Survey of Current Business." The GNP Implicit Price Deflator is published quarterly, and seasonally adjusted.

[4]The basis for calculation of this index was revised to 1982 = 100. 1984 and 1985 figures have been adjusted to that basis. The basis for calculation prior to 1984, 1972 = 100.

[5]US Bureau of Labor Statistics, Washington, D.C.: "Employment and Earnings." All data based on 1972 revision of SIC Manual. Data for 1970-1976 are adjusted to the March 1977 benchmark. Data for 1977-1978 are adjusted to the March 1979 benchmark. Data for January 1979 and beyond are adjusted to the March 1980 benchmark.

[6]Monthly data 1970-1978 for Producer Price Index-Industrial Commodities, Consumer Price Index, and Employment and Earnings SIC codes 10, 333, and 28, and quarterly data for GNP Implicit Price Deflator appear on pages 4.6-4.8 of Report 139.
Monthly data 1977-1978 for Employment and Earnings SIC Codes 10, 333, and 28 appear on page 33 of Report 147.
Monthly data 1970-1978 for Employment and Earnings SIC Code 36 appear on page 23 of Report 154.
Monthly data 1977-1980 for Producer Price Index-All Commodities, appear on page 21 of Nuexco Report 158.

[7]Monthly data 1979-1982 for all listed indices appear on page 41 of Report 184.

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